POPULAR MECHANICS

An Illustrated Weekly Review of the Mechanical Press of the World

"Tells you how to do things." Smithsonian Institution "Written so you can understand it"

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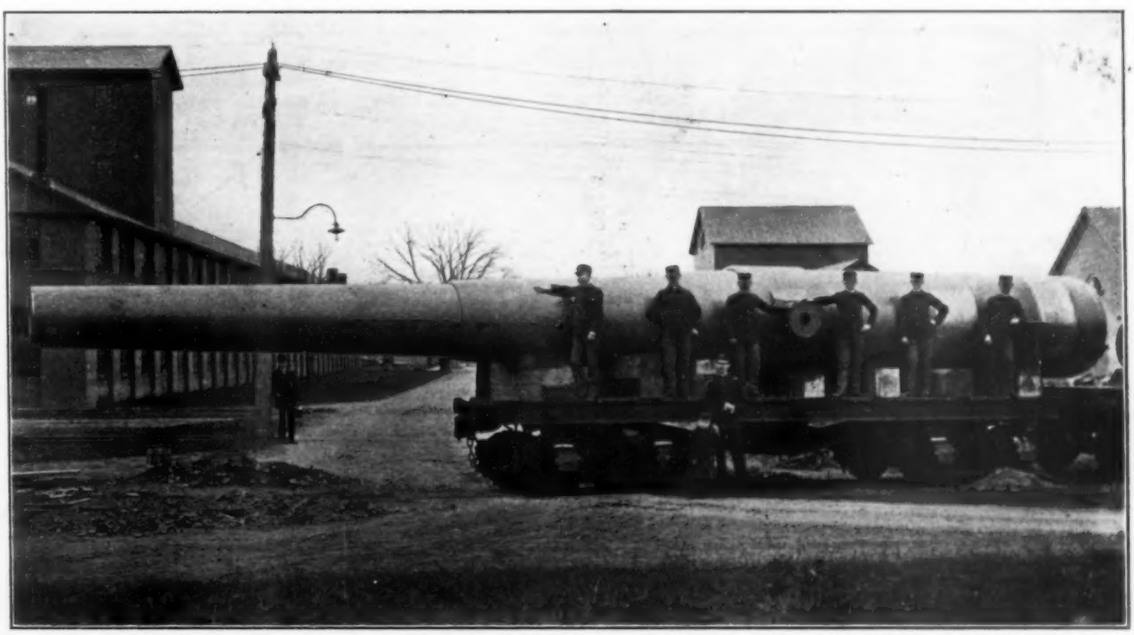
Greatest Gun Ever Constructed



The 16-inch Gun on its Way to the Proving Grounds. From this Mammoth Was Fired a Charge of 642 Pounds of Smokeless Powder

IN THIS ISSUE:

Greatest Gun Ever Constructed.
No Such Thing as Self-Ignition of Cotton.
Bread Pan that Won't Burn.
A City of Street Cars.
A Steamer Meets with Waterspouts.
A Shark Slaughtering Syndicate.
Shooting an Oil Well.
A Tug's Long Trip.
The Lake Dwellers of Venezuela.
Self-closing Fire Door.
Telephones that Give Fire Alarms.
Making Rope for Cowboy Lassos.
Wireless Telegraphy and How It Works.
War Opens Up New Field for Automobiles.
Stole a Street Car.
Easy Electrical Experiments:—An Electrically Lighted Lamp.
Shop Notes:—Chimney for Gas Stoves.—Making a Steam Turbine Out of a Water Wheel.—Underground Storage Tank for Gasoline.—To prevent Smoke from Flashlight.—A Tool for Removing Tire Bolts.—Substitute for Stereopticon.—A Wheat Cleaning Wrinkle.—Electric Machine that Locates Ores.—White "Inks" are Only Paints.
Device to Destroy Submarines.
Building Breakwaters in South Africa.
Umbrella as a Life Buoy.
The Steamship Kaiser Wilhelm II.
A Strike Bulletin.

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MAY 28 1903
SMITHSONIAN DEPOSIT.

$1,200 A YEAR FOR LIFE

Secured by Small Monthly Payments

Crude Rubber is to-day worth twice as much as it was ten years ago. Everybody knows that a pound of rubber costs more money than a bushel of wheat. Its uses are constantly and enormously increased from year to year. Every industry, every branch of science, daily finds some new purpose for it, for which nothing else will answer. It is as indispensable to our modern civilization as wheat—or coal—or cotton. Yet its production is on the same primitive and uncertain basis as it was on the day when Goodyear first made rubber a commercial possibility.

The world's present inadequate supply of crude rubber is gathered by tapping wild rubber trees that are scattered here and there in the jungles of American tropics. The ignorant and improvident natives who are engaged in this pursuit invariably "tap to death" the trees, unrestrained, because of the climate, by white supervision. Because they have to penetrate farther and farther into the jungle each year, at an added outlay of time and money, and because the supply of the wild trees, in answer to the incessantly increasing demand, is rapidly vanishing, the price of crude rubber has doubled in the last decade.

There is nothing speculative about Crude Rubber. It can be gathered every day in the year, irrespective of weather or season. It can be sold every day in the year, in every market in the world, and at a stable price that has been steadily advancing for many years.

We have 6,175 acres of the finest rubber land in the world, and with the finest climate. On this land we are changing the production of crude rubber from the primitive and destructive method now employed by the natives to the most scientific and economic plan know to modern forestry. You cannot name any article of world-wide use whose production has undergone so radical a development as we are now engaged in without vastly enriching those interested in the change.

An acre of rubber trees brought into bearing on our land will produce a net income of from $200 to $300 a year for more years than you can possibly live. These figures are not paper estimates and they are not ours. They are based upon results now being actually obtained in scientific rubber culture, and they are proven by the most reliable sources of information in the world—the Government reports of the United States and Great Britain.

We plant 600 trees to the acre and "tap to death" 400 of them, getting every ounce of the rubber milk from them, and leaving 200 trees to the acre, the norman number for permanent yield. The advantage of this early tapping is that by so doing dividends begin the same year, and are sufficient, before the shares are all paid for, to pay your money nearly all back.

Five Acres, or Shares, in our Rubber Orchard planted to 1,000 trees will at maturity yield you a sure and certain income of $100 a month for more years than you can possibly live. Your dividends average 25 per cent. during the period of small monthly payments.

The remarkable opportunity is now open for securing shares in this great enterprise, each share representing an undivided interest equivalent to an acre of land in our orchard. There is no large cash-down payment, as the purchaser pays for the shares in modest monthly installments running over the development period. Supposing you buy only five. You can pay $20 a month for 12 months, then $10 a month for a limited period, until you have paid the full price of the shares in the present series—$276 each; but during the period of these payments you will have received dividends amounting to $210 per share; hence, the actual net cost of your shares, or acres, is only $66 each, and from the maturity period onward, longer than you can live, your five acres, or shares, will yield you or your heirs a yearly income of $1,200. This is a most conservative estimate (based on Government reports of the United States and Great Britain) for 200 trees per acre, and figuring them as yielding each only two pounds of crude rubber per year, a total of 400 pounds, at 60 cents net per pound. Of course, if you buy 10 shares your income would be $2,400 yearly, or better still, 25 shares will yield $6,000 a year.

You can not name any article more indispensable to our modern civilization than Rubber, nor any article of absolute necessity whose price has advanced so rapidly and steadily in the last few years. For a quarter of a century the world's supply of Crude Rubber has always been spoken for, months before it has reached a civilized market.

Our shares are selling above par right now. The price will be advanced again without further warning to the readers of this paper, when the few shares that remain in the present series are all sold. Reserve your shares at once by wire or letter and secure the present price. Thus you will have time to investigate thoroughly before buying.

We can prove to you that five shares in this investment, paid for in small monthly installments, will bring you an average return of TWENTY-FIVE PER CENT. ON YOUR MONEY DURING THE PERIOD OF PAYMENT, and will then bring you $100 A MONTH FOR MORE THAN A LIFETIME. **Send us at once $20 as the first monthly payment to secure 5 shares—$40 for 10 shares—$100 for 25 shares ($4 per share for as many shares as you wish to secure).** This opens the door for yourself not to wealth, but to what is far better, a competency for future years when, perhaps, you will not be able to earn it. We already have hundreds of shareholders scattered through 40 States, who have investigated and invested. Our literature explains our plan fully and concisely, and proves every statement. We will send it to you immediately on request.

Mutual Rubber Production Co.

113 Milk Street, BOSTON, MASS.

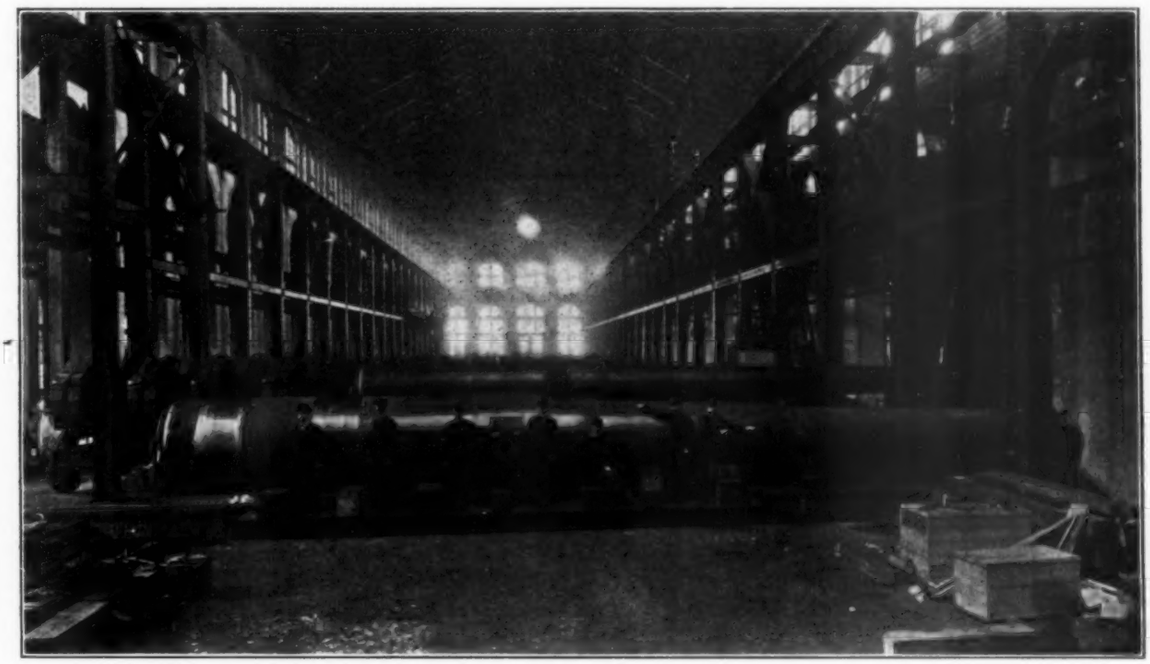
Successful Test of the Greatest Gun Ever Built

Largest Charge of Smokeless Powder Ever Fired--Weighed 642 Pounds--Shell Weighed 2,400 Pounds--An Experiment Without a Precedent

"When we test this gun to-day we are going beyond any point ever reached before. We will fire from it a larger charge of smokeless powder than has ever been fired from any gun. It may be that it will generate heat so great that the powder will not behave itself. If that is the case we will not, of course, get the results we are looking for. It may be that such a tremendous charge will be enough to demolish the gun. We do not know what may happen. This is purely a test, and it is a test without a precedent."

So spoke General Crozier, chief of the United States ordnance bureau before the making of the recent tests of the great new United States 16-inch guns at the Sandy Hook proving grounds.

When he had finished talking a shell weighing 2,400 pounds was brought to the breech on a truck and rammed home by the united efforts of twenty strong men. Then six men came forth carrying the charge of powder that was to fire this shell. Each man carried a canvass bag, each filled with 107 pounds of powder. The six bags of powder, 642 pounds in all, was loaded into the breech.



The Great 16-inch Gun Ready to Leave the Arsenal—By Courtesy Journal American Artillery Association.

Then the great gun was pointed seaward, the crowds of onlookers retreated to a safe distance, and all stood in breathless silence while the gunner did his work. There was a rush of flame reaching 100 feet in front of the gun; a terrific crashing, roaring sound that shook the very earth; thousands of yards out at sea a column of spray rose and hurled itself heavenward, richocheted twice sharply to the right, indicating the path the shell pursued in its descent before sinking beneath the waves. The discharge gave a powder chamber pressure of 38,000 pounds to the square inch and a muzzle velocity of 2,306 feet per second.

Three of the mammoth charges were fired and each with perfect success. The elevation was 1½ degrees for the first two shots and 4½ for the third. At an elevation of 40 degrees it is estimated that the gun will throw a shell 21 miles. As the tests more than fulfilled the previous estimates there is little doubt that this calculation will also prove correct at another trial to be made in a short time.

When the roar of the great gun had ceased echoing among the hills; when the many sacks of powder had vanished into smoke, and the sea, slashed by the ferocious shells, had relapsed into tranquility, General Crozier said:

"When a gun has handled the largest charge of smokeless powder ever put into a gun, as this one has, it is safe to say that it is an absolute success. Everything has worked to our satisfaction. There was a lot of trouble making this gun, and there are many ways in which it might have been a failure. The breech might have blown out or become jammed, but, thank goodness, nothing did happen, and the tests have been a success. Of course there is a lot of work to be done yet. The bore must be measured with a star gauge to see if the tremendous explosion has caused any permanent expansion. If there is any expansion beyond a few hundredths of an inch it would mean the failure of the gun. This gun is something new in ordnance, and after today I can safely say that it has come to stay. These tests show one thing, and that is that this gun can be fired with accuracy so as to hit an enemy's vessel at from five to seven miles and can get an extreme range of as far as twenty miles, which is much greater than any gun has ever attained."

BUTTON MANUFACTURE.

There are 238 establishments in the United States in which buttons are manufactured. In number of factories New York state ranks first, New Jersey second and Pennsylvania third. The capital invested in the business throughout the United States amounts to $4,250,000. This at first glance would appear small considering that the machinery used in the process is very intricate, almost human in its workings and quite expensive, but the cost of the raw material is comparatively small. There are about 10,000 men employed in the industry in this country.

TURTLES.

An interesting creature is the "highland turtle" or box tortoise of the South. Down in Florida it is called the "gopher." When frightened it shuts up its shell, so that no animal can penetrate it. Coons sometimes get their paws caught in the "doors" and good-by Mr. Sly Coon. The writer tried for days to induce one of these box tortoises to move. We used to find the "birds" in the woods and lay them in wagon roads for the wheels to roll over them. Tons have no effect. The highly convex carapac will sustain enormous weights without injury. Farmers break the shells with axes and feed the terrapin to the hogs. The only way to make a box tortoise move along is to build a fire on his back. You might almost say "heap coals of fire upon his head." Once well warmed up, he will open his shell and hustle.

War Opens Up a New Field for the Automobile

First Service in Actual Hostilities Shows the Superiority of the American Motor Vehicle for Rough Service Over Those of All Other Nations

Exploding mines, running dynamos, operating search lights, making tea, transporting supplies and serving a hundred other purposes, the automobile proved itself to be one of the most valuable weapons of the British during the Boer war. This was the automobile's first actual service in war, and its record was such as to establish it as a fixed equipment of the British army for all future time. Automobile

corps are now being organized in nearly all the British possessions.

But it was an American make of vehicle—the Locomobile—that served the British to the best advantage in their struggle against the intrepid Boers. The British and French made vehicles proved to be too clumsy of operation and in the task of wading through rivers, climbing kopjes and making dashes along the obstructed roads, they proved themselves sadly deficient in comparison with the light and strong American car. Of such service was the American automobile to Capt. R. S. Walker's engineering command, that he has written an article on the merits of the car in war. In the article he states:

"The best work done by the Locomobile was in its trial trip with the trailer, when it blew up the mines at Klein

Going Through the Crocodile River

Nek. These mines, 18 in number, were laid some eight months previously. All the insulation was burnt off the wires, and the battery was useless. It had been anticipated that a dynamo exploder would be inadequate to fire them, so a 250-volt, two-horse power motor which happened to be in Pretoria, weighing about three or four hundred pounds, was placed on the trailer, and a quarter of mile of insulated cable, some testing gear, the kits of three men, and their rations for three days and a case of gasoline for the car, were also carried on the car and trailer.

"As the rise became steeper, the stones became very large and the car had to be taken along very gingerly to prevent

Exploding Mines

breaking of the wheels. A halt was made about a quarter of a mile from the top of the Nek, where the mines were: these were reconnoitered, the wire, etc., was picked up, that portion which was useless was placed on top of the charges and the remainder taken to the car. The dynamo was slid off the trailer, the car backed against it, one wheel raised slightly and placed against the dynamo pulley, which was

Making Tea

held up to it by a man using his rifle as a lever; the other wheel was on the ground with a stone under it. The balance gear being free the dynamo was excited without the other wheel moving and the load being on for a very short time—from the time of touching the lead on the dynamo to the terminal to the firing of the mines—no harm could come to the car. When all the lead had been joined to the dynamo the car was started and after a short time, when it was judged to have excited, the second terminal was touched. A bang and a cloud of dust resulted and the Klein Nek mine field had ceased to exist.

"The day was extremely hot and the work had not been

light, so the tea made with water drawn direct from the boiler which we were able to serve round to the main body of our escort was much appreciated.

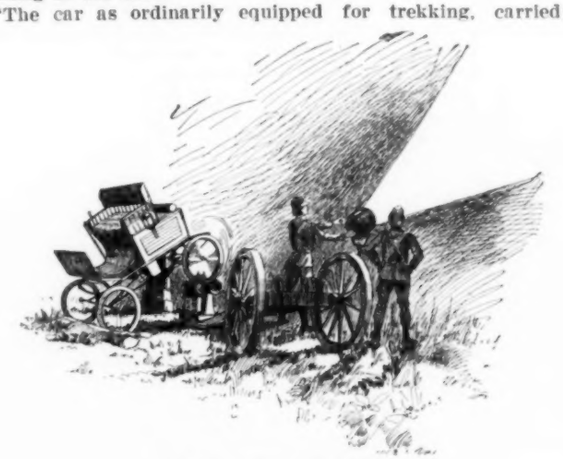
"On our last trip in going through the Crocodile river, water was splashing all over the car and right up to the footboard.

"The Locomobile performed some very useful work in visiting out-stations, where search lights were either installed or

Towing Ammunition.

wanted, and in this way we visited nearly all the larger towns in the Transvaal. The car was also used as tender to a search light plant on a gun carriage and limber, being utilized to fetch gasoline, carbons, water, etc.; also to run the dynamo for charging the accumulators used for sparking, thus saving running the gasoline motor specially for this purpose. To do this the trail of the carriage which held the dynamo was lowered to the ground, the back of the car was lifted up, one wheel being supported on the dynamo pulley and the other clear of the ground, and two bolts were passed through the balance gear to jam it. On one occasion the car furnished power to run a powerful search light for an hour, driving a dynamo in this way. In consequence of this a trailer was made to carry a dynamo and projector for search lighting in the field.

"The car as ordinarily equipped for trekking, carried:



As Tender to a Search Light.

blankets, waterproof sheets, etc., for four men; four planks for crossing ditches, logs, stones, etc.; all necessary tools and spare parts; a day's supply of gasoline; a couple of telephones; one mile of wire. In addition on the trailer, if used for search lighting: one 30 cu. projector, fixed between trail; one automatic lamp for same; one dynamo, 100 volts 20 amps.; two short lengths of cable; two pairs of carbons; tools, etc.

Contracts for about nine miles of pneumatic tube service in Chicago taking in the depots and a number of postal stations has been awarded to the Chicago Pneumatic Tube Company.

It is claimed that the juice of the lemon will kill the germs of typhoid fever in water.

More steel is used in the manufacture of pens than in all the sword and gun factories of the world.

NO SUCH THING AS SELF IGNITION OF COTTON.

It Will, However, Conceal Fire Within It for Weeks and Suddenly Burst Into Flames.

By Henry W. Diedrich, United States Consul at Bremen, Germany.

Vessels laden with cotton are not infrequently reported as having fire aboard, and it is commonly assumed that it is caused by the self-ignition of cotton. However experts have come to consider that cotton, being of the same composition as wood, cannot of itself become ignited.

Recently one of the highest Prussian courts decided an important case of this nature by declaring that there is no such a thing as self-ignition of cotton. A firm at Lodz, in Russia, had entered suit against the Breslau-Warschau Railroad Company for $8,500 damages for cotton lost by fire. It appears that a shipment of American cotton had been sent in different lots, from Bremen to the plaintiffs, over the road of the defendant, to the station Wilhelmbrueck, in Silesia. The shipping agent there stored 365 bales outside the freight depot alongside of the railway track, and left them for some time exposed to all sorts of weather and accidents.

One day the bales burst into flames while a locomotive was doing some switching near by. The plaintiffs claimed damages, resting the suit upon the assertion that the fire was caused by a spark from the locomotive, and therefore holding the railroad responsible.

The entire responsibility for the damage therefore rested with the shipping agent, who represented the plaintiffs, and allowed the inflammable cotton to lie for months without any protection.

The Breslau court handed down a decision, the substance of which was as follows: Self-ignition of cotton is entirely out of the question, according to the universally acknowledged opinion of men of science and men of experience. It is a peculiarity of cotton that it may conceal combustible matter within it for weeks, and longer, as was seen in this very case, for several bales of cotton that were saved from the fire and lay in a pond for some time during the following winter suddenly burst into flames in the following spring without any cause, as was proved by competent witnesses.

Therefore, the plaintiffs themselves and their shipping agent were solely responsible for the damage done by this fire, not having taken proper steps for the protection of their property.

ENGLISH FOOD SUPPLY IN WAR TIME.

The effect of the Morgan steamship trust on the food supply of Great Britain during war with another national has been the subject of vigorous and general discussion by the press of England. The Shipping World of London does not share the alarm of the daily press and says:

"We are now beyond all contest in a position to conquor on the high seas any possible combination of fleets that might come into collision with our navy. It is the duty of statesmen and the desire of the country to continue to safeguard our food supplies in the eventuality of war, through the maintenance of our fleet in its present high state of efficiency; for, notwithstanding foolish criticisms at large, all our scientists and responsible statesmen know quite well that it is in a high state of efficiency; and the country feels assured of it."

BREAD PAN THAT WON'T BURN.

A bread pan that will not burn the bottom of the loaf while the top remains uncooked has been devised. The method is

This Pan Won't Burn Bread.

very simple and consists of placing under the pan metal rods which always leave an air space between the pan and the floor of the oven.

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A CITY OF STREET CARS.

Strange Settlement Where the People Live In Abandoned Street Cars.

A city where the people live in street cars is one of the unusual sights the visitor sees in one of the suburbs of San Francisco. When the old cable cars are worn out the company sells them for a few dollars each, and these are moved to a location where land is cheap or can

Street Cars Used as Houses.

be had for a rental of a dollar or two a year. A small family find shelter in a single car, but frequently a more pretentious residence is secured by placing two cars together. The occupants of such are the aristocrats of the settlement, which consists of working people.

A STEAMER MEETS GREAT WATERSPOUTS.

The Kosmos liner, steamship, Memphis, which has just reached San Francisco direct from Hamburg, reports having had some very exciting experiences with great waterspouts on the voyage. These huge whirling liquid pillars were encountered after the Memphis had passed Panama.

These spouts appeared to be not less than 30 feet in diameter at the base, and extended skyward as far as the vision reached. The spiral pillars went rollicking past the steamer at a distance of a mile, or even less. Some approached uncomfortably near, and created no little apprehension on board the vessel. The spouts seemed very lively; they went dancing along at a furious rate of speed; at frequent intervals they entirely disappeared in the depths, only to shoot aloft again further away, like vast piston-rods.

Notwithstanding the distance, the roaring and growling of the waterspouts were plainly heard by those on board the Memphis. The spectacle was a sublime, appalling one. Fortunately the steamer managed to avoid these dangerous pillars.

A SHARK SLAUGHTERING SYNDICATE

American ingenuity has scored another triumph in the organization of the Havana American shark syndicate, organized by a sharp American promoter from Chicago who discovered that the Havana, Cuba, authorities had authorized a $3 bounty for every female shark and a $2 bonus for every gentleman of the same species.

The promoter discovered that the shark is inordinately fond of dog meat. So he proceeded to procure as many deceased canines as possible and to each he attached a high explosive cartridge. As peaches and cream to the rural youth, as ripe red watermelon to the colored gentleman, so is nice dead dog to the man-eating shark. So the syndicate sent out a few unloaded dogs into the gulf stream. The news quickly spread among the sharks and all became aware that some benefactor was sending out toothsome morsels for the delectation of his sharkship. After a few days of this baiting the loaded dogs were floated out and when the hungry man-eaters crowded by the hundreds to fight for the epicurean morsels, the man in the boat pressed the button and the explosive did the rest.

The supply of dogs in Cuba and the supply of sharks in the ocean being alike inexhaustible, the established fact that four pounds of the explosive attached to one dog would furnish the syndicate with at least a dozen sharks, averaging, in municipal bounty $2.50 each; a "catch" from one boat not consuming more than 30 minutes, proves that the shark killing business will be a most profitable industry for the enterprising American.

It is said that more than 20,000 laborers are employed in the automobile factories of France. About 5,000 new vehicles, valued at $6,000,000, were made last year. At the Paris Exposition in the same year no fewer than 700 manufacturers were represented.

SHOOTING AN OIL WELL.

Terrific Explosion of 140 Quarts of Nitroglycerine

The shooting of an oil well is always an exciting event, not only for the results which means success or failure, but on account of the explosion which

Explosion of the Shot

shakes the earth and fills the air with noise.

One of our readers sends a photograph of the shooting of a well on April 1st, last, and writes: "This well belongs to Garn, Foster & Co., on the Geo. Nickle lease, four miles west of Fremont, O. It was shot with 140 quarts of nitroglycerine, and when the "go-devil" struck the explosive the shock of the explosion was terrific. Water, oil and rocks were hurled high in the air. The photograph was taken by O. J. Garn, of Helena, O., who is an enthusiastic amateur photographer, and who could not resist the temptation to secure the picture, which was accompanied at no small personal risk to himself."

A TUG'S LONG TRIP.

The little tug Fortune has made the trip around the Horn from Culebra, W. I., to Bremerton Navy Yard, State of Washington, 13,000 miles. The venturesome little craft is 137 feet from stem to stern and has a 26-foot beam. Her gross tonnage is 378. She carries 28 men. The only other tug that has made the trip is the Slocum, now at San Francisco.

The largest poplar tree in the world is said to be near the trail which leads to Craggy mountain, which overlooks the Biltmore estate in North Carolina. It is 10 feet in diameter, 30 feet in circumference and is supposed to be about one thousand years old.

HOW TO LAY A TILE FLOOR.

No tile floor can be laid level or lasting over a poor foundation, says Municipal Engineering. It is the custom in many buildings to use the leavings of the mason or other debris in the cellar, scatter some Rosendale cement over it, throw it into the space to be filled, then drown it with a hose and pound it in. As a consequence there is no bond and the material will shift by vibrations. Sometimes the plasterers' scrapings are mixed in, and this will always cause trouble by swellings.

Good steam cinders with one-third sand mixed dry with natural hydraulic cement and just dampened and turned over several times and thoroughly rammed will make a good foundation, care being taken to see that all spaces are filled solid. It is customary for the mason to bring this level up to about two inches from the required finished levels. If there are any pipes to carry steam or hot water cinders only should be used in a bed of about two inches on either side of them.

Tile Foundation—Presuming that the mason's foundation has set properly and has not been disturbed, levels are established and a mixture of six parts sharp, clean sand to one of good Portland cement, well turned before wetting, then only dampened and mixed thoroughly, is spread with a rake two inches thick, rolled or rammed down and scraped over with a straight edge, leaving this foundation one inch below the finished level.

This tile foundation should be laid twenty-four hours ahead of the tile setting and protected by boards for mechanics to walk upon.

Tile Setting—If the tile are semi-vitreous they should be soaked in clean water for two hours and then drained on edge on boards for half an hour before being set in floor and should be supplied to the tiler on boards about three feet long, piled up with the top sides up and the edges flush.

Provide sufficient straight edges of white pine three-quarters of an inch thick by four inches wide, planed true on all sides, also several beating-in blocks of apple, cherry or some close-grained wood eight inches long, four wide by two thick, one side smooth. Lay a straight edge against the base board or line of same and another parallel to it about three feet distant, but the actual width of the border and an exact number of tiles. Lay these straight edges in lime cement mortar, the top surfaces being the levels of the finished tile floor. Behind the outside straight edge drive some long nails into the foundation to keep it in place. Take a straight piece of board six inches longer than the space between the straight edges and make a screed by cutting back on one edge about four inches from the ends and to a depth of two-thirds the thickness of the tile so that when the cement is spread with the flat trowel it can be screeded off with the board, the ends working in the straight edges previously set.

Mix thoroughly three parts sharp, clean sand to one of Portland cement dry, then wet sufficiently to allow of stiff flow under flat trowel, fill in space, screed, sprinkle a little dry cement and place in the tile, scatter a little fine, white sand over the tile (we use screened sea sand in this district for this purpose) and beat in gently with wood beater by hand till tile are all placed, then use hammer on block till driven home. When home use the block like a scrubbing brush with a rotary movement till tile are all true. If water comes up over the tile the mixture was too wet. Take up a few tile and sprinkle some dry cement.

It is better to start tiling in a square corner away from supply. If the corner is not square the border may be cut a little, but architects prefer to show full width of border, in which case lay from longest straight side of room so as to have cutting on one side. Do no hammer in the tile till all the cement surface is covered with tile.

Remove straight edges, relay five feet from last finished edge after cutting cement close up to the tile laid, make new screed for this width and proceed as before, laying plank on tiled portion and working from both sides. Do not leave straight edges down over night, but clear off thoroughly and lay flat. Be sure to cut cement up close to tile. After laying first section of tile the laid tile is used as the inside straight edge.

The next day sweep the tiled floor clean, mix up pure cement and water to a thick cream and spread in this grout with the edge of a short board. After two hours' set, rub clean with sawdust or excelsior and when finished cover with clean saw dust, if other mechanics are going on the work. One part commercial muriatic acid to ten parts of water mixed in wooden pail and applied with broom will remove Portland cement stains. Tiles up to three inches square, laid with close joint, but above that, should be laid with open joint, the joints should be thoroughly filled with mixture of vaseline and paraffine wax to further protect tiles during the grouting. Do not remove vaseline mixture till after the acid has been used.

Care should be taken in obtaining levels from some one responsible and where borders are to meet baseboards not yet placed, obtain the lines from the marble man or carpenter or you may be obliged to relay your borders.

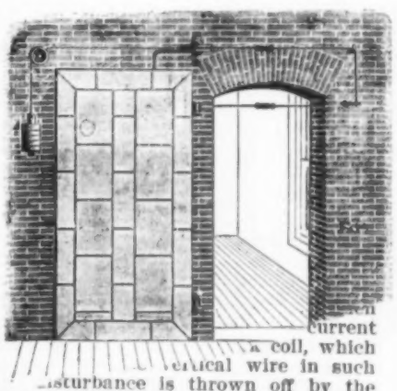
The Lake Dwellers of Venezuela

The Lake Dwellers in the Interior of Venezuela.—Courtesy Four Track News

No furnaces to look after, no lace curtains to take down, and no dust in the house is the happy lot of the housekeepers of a strange race known as the Lake Dwellers. During four centuries a race of Indians have lived in this strange fashion, with few wants and great contentment. The lapping of the waves has been the only slumber song the little ones have ever known. Some of these houses are of quite good size; they are covered with thatched roofs, and are quite inaccessible whenever the owner pulls up his front stairs.

SELF-CLOSING FIRE DOOR.

Many a large fire would not have amounted to much if some one had only been present when it started, to close a fireproof door and confine the flames to one room. An automatic device is now



current
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trical wire becomes a radiator of electric waves
direction. The effect produced is the same,
as that caused by dropping a stone into a pool of
corresponding to the radiations of the electrical discharge
through the ether.

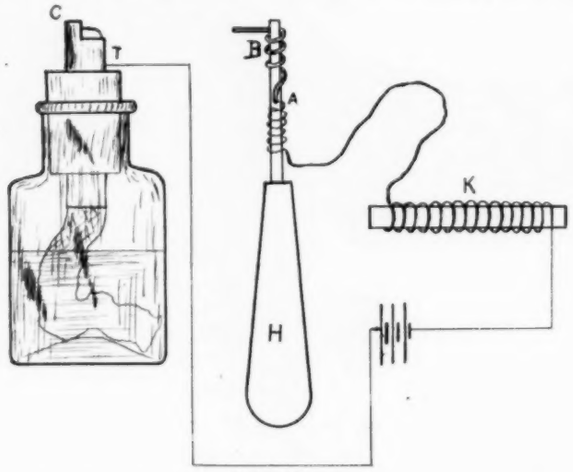
The receiving apparatus to catch these impulses consists
of the receiving vertical wire running down to the coherer

Easy Electrical Experiments

By L. P. Dickinson

AN ELECTRICALLY LIGHTED LAMP.

The electric spark is quite commonly used to ignite gas, as all readers are doubtless aware. For this purpose either the spark from the secondary of a rather powerful induction coil, or the direct spark caused by the breaking of an electric circuit in proximity to the stream of gas, may be used. The former plan has the advantage that the apparatus may be worked at a distance by the mere pressing of a button, while in the latter case the apparatus must be worked at the place where the light is desired. It has the advantage, however,



Lights a Lamp.

that the apparatus required is simpler and cheaper than in the first case.

Not only may illuminating gas be thus ignited, but the vapor from highly inflammable liquids, like gasoline and alcohol is also easily lighted. Electric cigar lighters are made containing alcohol, and a wick, so arranged that the wick will burst into flame when a spark occurs near it.

The small alcohol lamp described in this chapter cost but little to make, and illustrates the principles involved very clearly, and may be of some practical use as well.

There will be needed first of all, a small wide-mouthed bottle, something like a horseradish bottle, but smaller. Those in which glue and paste are often put up are about the right kind. Fit to this a smooth cork. Through the center of this cork is to be fitted a brass or iron tube, long enough to project ½ inch above and below the cork, and about ⅜ inch in diameter. The brass tubes of which curtain fixtures are often made will answer the purpose. At the bottom the tube is cut square across, but at the top a lip is left projecting, as shown at C in the accompanying figure. Through the tube is to be thrust a circular wick such as are commonly used in torches.

At H is shown a wooden handle into which is fastened a metal rod, about 3-16 inch in diameter. An old button hook with the end cut off will answer very nicely. On the end of this rod is slipped a rather stiff metal spring, shown at B, with one end straightened, and projecting about ½ inch. The [illegible] end is coiled about the rod and is soldered to the latter

[illegible]ented an ordinary spark coil, such as may be [illegible]rical supplies. It can be made very [illegible] a bundle of soft [illegible] ⅜ inch [illegible]ger than [illegible] so

battery of three sal-ammoniac cells, the other terminal being connected to the brass tube at T. The remaining terminal of the coil is connected to the metal rod at A.

Now if the handle H be held in the hand, and the spring B is drawn firmly across the projecting lip at C, a heavy spark will be produced very close to the end of the wick. If the wick be saturated with alcohol this spark will be sufficiently heavy to ignite the alcohol. The bottle should be kept well filled.

In order to keep the wick moist, and to prevent waste of the alcohol, a small brass cap should be provided which fits tightly over the end of the tube when the apparatus is not in use.

THE FUTURE LOCOMOTIVE.

It will probably be safe to predict that a date not far distant will see all locomotives that are intended for fast passenger service built on ten wheels says Page's Magazine. The tendency in that direction on the European and American continents, as well as in Britain, is so marked as to be quite unmistakeable. It is not meant that the express engine of the future will necessarily be of the type which some American writers and their British imitators term, with regrettable ambiguity, "the ten-wheeler;" but simply that it will be a ten-wheeled engine. It may be fairly said that when we find such engineers as Mr. Churchward, Mr. Ivatt, Mr. Worsdell, Mr. Aspinall, Mr. Robinson, and Mr. McIntosh all making the practical trial of one or other of the two main types of ten-wheeled engines for express duty, these engines have not only come to stay, but also are practically certain to hold an exceedingly prominent place among the express locomotives of the future.

MAKING ROPE FOR COWBOY LASSOS.

Cowboys of the Western plains always prefer the Mexican hand-made rope for making their lassos. This rope is usually made by crude hand-made machinery at the Mexican coun-

Mexican Rope Makers.

try homes, and the women are often experts in the work. The raw material is obtained from the strong Mexican grasses.

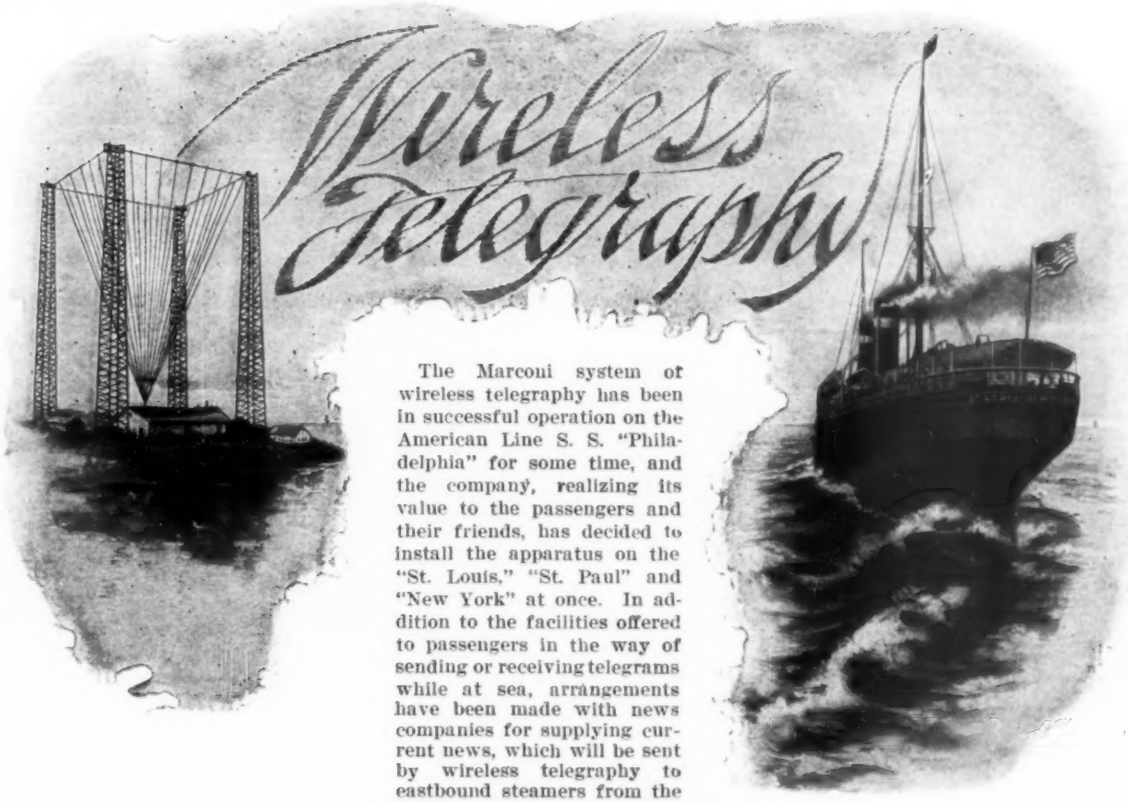
Anthracite coal is said to have been discovered in Vancouver island.

Popular Mechanics wants are worth twice the price; just try one.

Gutta percha trees are said to have been discovered in abundance in German New Guinea.

Exports from Galveston, Texas, last month amounted to [illegible]arly $10,000,000.

[illegible] and Sweden are now connected by a submarine [illegible]ble.



The Marconi system of wireless telegraphy has been in successful operation on the American Line S. S. "Philadelphia" for some time, and the company, realizing its value to the passengers and their friends, has decided to install the apparatus on the "St. Louis," "St. Paul" and "New York" at once. In addition to the facilities offered to passengers in the way of sending or receiving telegrams while at sea, arrangements have been made with news companies for supplying current news, which will be sent by wireless telegraphy to eastbound steamers from the Poldhu station on the coast of England, and to westbound steamers from the Siasconset station, Nantucket. Steamers fitted with wireless telegraphy apparatus are practically in continuous communication with either shore stations or with passing steamers.

WIRELESS TELEGRAPHY AND HOW IT WORKS.

Mysteries of Its Operation Unfolded — Its Development and Commercial Utility.

By T. Commerford Martin, Special Agent, United States Census Bureau.

One of the latest and most important developments in telegraphy is that to which the epithet "wireless" has been attached, although this is neither accurate nor descriptive, as there is more or less wire in the circuit in spite of the fact that none stretches between the transmitting and receiving apparatus in the old and familiar manner. Wireless telegraphy still remains to some degree mysterious to the public, but has been in commercial use for several years and was a regular manufacture during the census year—although the work in America at that time was still largely experimental.

The most prominent worker in this field is Mr. G. Marconi, an Anglo-Italian, who has already transmitted signals between the English and North American shores of the Atlantic, through the air, a distance of nearly 3,000 miles, and whose commercial work over shorter distances is being rapidly developed as the results of his experiments, beginning as far back as 1895-96.

In passing it should be noted that wireless telegraph systems of a different nature had already been developed in this country several years ago by Mr. Edison and others, depending upon the principle of induction, and employed more specifically as a means of telegraphing to and from moving trains. In this work inductive signals are jumped across the air space between the ordinary telegraph wire on the track and the metallic roof of the passing car, which contains the receiving apparatus, and the signals are recorded by means of buzzing dots and dashes heard in a telephone in the receiving circuit. In the same manner the operator on the car desiring to send a message depresses his own key, which causes an induction coil to operate by local battery, through a vibrator, to charge and discharge the car roof at a high potential and rapid rate. These effects, corresponding to the dots and dashes, are taken up by the ordinary parallel wires along the track, so that the operator on the line will hear the dots and dashes in his telephone, and thus receive a message. It is recorded that messages have thus been sent over spaces of between 300 and 400 feet from the condenser roof of the car and the telephone wires, with the train running forty miles an hour. Other developments by Mr. Edison in this field include the use of condensing metallic surfaces and static effects to signal at considerable distances, using balloons, the sails of ships, etc.

It remained, however, for Mr. Marconi and other workers in this field to accomplish the feat of transmitting telegraphic signals without wires through distances of hundreds of miles, employing what are known as "Hertzian waves," or influences imposed electrically upon the ether by electro-magnetic apparatus, these waves being detected only by special apparatus of the most delicate character. In Mr. Marconi's work the transmitting apparatus consists essentially of a special induction coil, which has one side of the secondary spark gap in the secondary circuit connected with the ground, and the other connected with a vertical wire carried up some distance into the air by a pole or by a kite or balloon. The two gap spheres are also connected with the ends of the secondary winding of the induction coil or transformer. The spheres are not always essential. When the operator in transmitting presses his key the current from the battery energizes the induction or spark coil, which in turn charges the spheres and the vertical wire in such a manner that electrical disturbance is thrown off by the vertical wire in the form of displacement waves in the ether, so that the vertical wire becomes a radiator of electric waves in every direction. The effect produced is the same, roughly, as that caused by dropping a stone into a pool of water, the rings or ripples pursuing each other to the shore, corresponding to the radiations of the electrical discharge through the ether.

The receiving apparatus to catch these impulses consists of the receiving vertical wire running down to the coherer

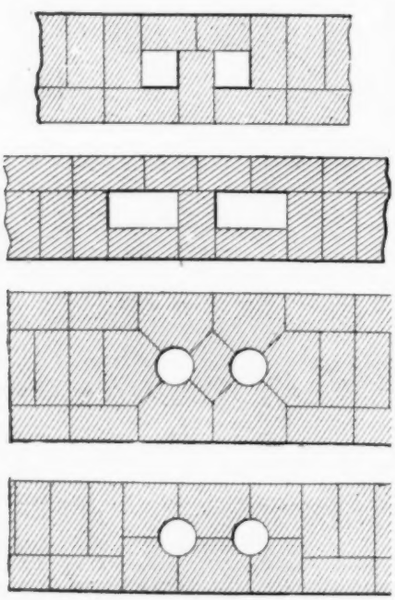
placed in a circuit containing a local battery, and a sensitive telegraph relay actuating in turn another circuit in which are included a trembler or decoherer and a recording instrument. One end of the coherer tube is connected to the ground and the other to an insulated conductor, terminating preferably in a "capacity" area exactly the same as that employed in the transmitting station. The coherer or Branly tube which detects these waves in the ether is usually a very small tube about the size of a gold pencil, and consists of glass with the wire running in at both ends, but separated by a very small space. In this space lie metallic filings, usually a mixture of nickel and silver. It would appear that when the filings are not subject to the influences of the ether waves they are of such a high resistance as to be non-conducting, so that the circuit of the local battery is open. When the ether waves impinge on the tube the filings between the two metallic pole pieces in the tube cohere and are apparently pulled together into such a continuous string or conductor that the current immediately flows in the local circuit from the local battery and the signal is recorded by the receiving telegraph instrument.

At the same time the litle tapper or decoherer in the relay circuit hits the tube a slight blow, and causes the filings to fall apart, thus opening the circuit again ready to receive the next etheric impulse, representing a corresponding portion of the message to be received. By this process of cohering and decohering, the signals are received, and in their continuity they constitute a regular telegraphic message, which can be read by the ear or recorded by a tape register, or be heard in the telephone. Other forms of self-restoring coherers are in use, including that employed by the Italian.

SHOP NOTES

CHIMNEY FOR GAS STOVES.

The chimney provided to take the smoke from furnaces is seldom large enough, but there is such a thing as having too much chimney room for a gas range. The amount of heat passing from the gas burners is not enough to



Gas Flues

heat the walls of a large brick chimney and thus provide the draft which is necessary. Now that gas ranges are coming into general use, architects are beginning to make provision for them, and are building special chimneys for the purpose. The Metal Worker illustrates several types, the plan being to furnish a separate chimney for each gas stove. As the chimneys are small this is not difficult, as there is little deposit of soot. The flues can be made either of special bricks or of cement. The flues shown are 4 by 4 in.; 4 by 8; and the round ones 4 in. diameter.

The Amsterdam canal is again being deepened. When the new works are completed the expenditure since 1865, when the matter was taken in hand, will amount to about $15,000,000.

A STEAM TURBINE OUT OF A WATER WHEEL.

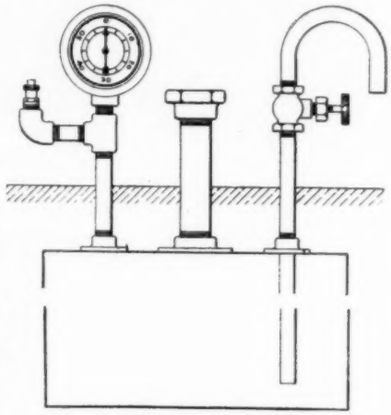
Mr. J. E. Johnson, Jr., tells in the American Machinist how he drove a Pelton water wheel with a steam jet. A tool-sharpening forge was to have a blower running at 4,500 revolutions per minute with 1½ horse power, and Mr. Johnson decided to try the experiment of driving this blower with steam operating a 6-inch Pelton water wheel having a bronze wheel. The steam pipe is ¾ inch, the nozzle 5-32 inch, and the exhaust pipe 1½ inches. A globe valve controls the supply of steam, and there are no blast gates or anything else used to regulate the blast. It was predicted that the wheel would not drive the fan at the desired 4,500 revolutions per minute, but as a matter of fact with the valve fully opened about 10,000 revolutions per minute are obtained, so that the steam has to be throttled. Mr. Johnson states that he believes the steam consumption to be less than with a reciprocating engine of like power. This Pelton water motor costs about one-quarter what a reciprocating engine costs, and has the advantage of requiring no connecting gearing, as it is coupled direct to the fan shaft. It is suggested that a centrifugal pump might be advantageously driven in the same way, and a small motor like this might also be geared to a derrick to replace hand power in winding. There is also no reason why compressed air may not be substituted for steam.

UNDERGROUND STORAGE TANK FOR GASOLINE.

Owners of automobiles like to keep a good supply of gasoline constantly on hand, but the only safe place for it is underground. A reader sends the Motor Age a description of a tank he uses with much satisfaction.

The gasoline supply tank is buried in the ground and is fitted with a valve which permits the attachment of an air pump, that pressure may be formed upon the gasoline to force the latter into the stable for filling the tank in the car. I enclose a sketch of this tank, thinking it may interest other automobile users.

The tank is made of No. 20 galvanized iron, and has a capacity of 50 gallons of gasoline. The supply pipe is carried almost to the bottom of the tank, and has a valve and curved discharge pipe above the ground line. The filling tube is of ¾-inch wrought iron pipe with pressure tight cap on top of the same. The air pressure and supply pipes are both of ¼-inch wrought iron pipe. An air gauge reading up to at least 30 pounds should be fitted on the top of the vertical part



Gasoline Storage Tank

of the pipe, a tee and elbow being fitted below the gauge for the reception of an ordinary tire valve, by means of which the air pressure is put in the tank. From 10 to 15 pounds pressure is all that is necessary to carry in the tank. The tank should be buried a suitable distance in the ground as illustrated.

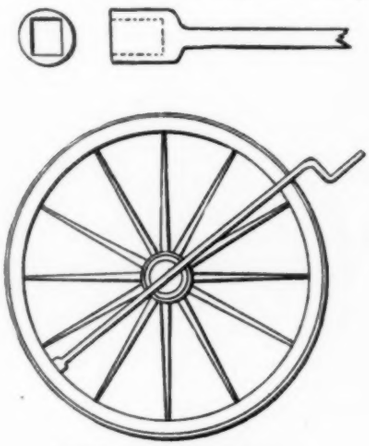
TO PREVENT SMOKE FROM FLASH-LIGHT.

To prevent the smoke from magnesium ribbon or powder from spreading throughout the room, support over the point where the ignition is to take place a large flat pad of damp wool lint. This may be done by tacking the lint to the underside of a board supported on legs. When ignition takes place, the products of combustion for the most part will become absorbed by the wool.

A TOOL FOR REMOVING TIRE BOLTS.

The following is a description from the American Blacksmith of a very useful tool for removing tire bolt nuts, as well as for screwing them on, and it may be of use to some one having much of this kind of work to do: Take a rod of ⅝-inch iron, long enough to reach across the hind wheel of the buggy with eight or ten inches to spare. Upset one end and drill a hole endways into it large enough to admit a tire bolt and deep enough for the same purpose. After heating the end of the rod, screw it into a vise, and by means of a square punch

square up the hole so as to form a socket wrench for the nut. Next make a crank on the other end to turn it with, and the result will be a tool such as shown in the illustration. It can take off and put on three nuts to one with the wrench.



A USEFUL TIRE BOLT WRENCH.

Of course, if the bolt turns, you must use a holder to hold it tight, but often this tool is far more useful than a wrench.

SUBSTITUTE FOR STEREOPTICON.

That a great scientist may also be a very practical man and something of an inventor of things useful outside of his particular work has been shown several times by Director Edward C. Pickering of the Harvard Astronomical Observatory. His most recent contrivance is a very simple but effective substitute for the stereopticon intended for use in private houses or in small lecture rooms, and especially designed for the display of negatives that it is desirable to examine in detail.

So simple is Professor Pickering's device that anybody can make it in his home workshop, and as it is not patented everybody is at liberty to. In fact it is nothing more nor less than a triangular box, such as would be obtained by cutting an ordinary box through from the corner at an angle of 45 degrees, the open side being covered with a piece of white porcelain. The inside is coated with white enamel paint, to give it a reflecting surface, and a 20-candlepower incandescent lamp, which may be connected with a regular fixture by a plug

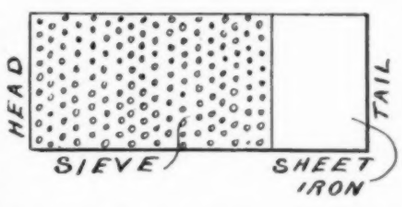
to an ordinary socket, is set in the middle where the illumination would be evenly distributed. The porcelain front, which is supported by a strip of moulding nailed to the lower edge of the box, diffuses the light and the negative is laid directly against it, resting on the same little edge.

Professor Pickering has found this appliance most useful for the examination of the photographic plates of the heavens which have such an importance in his work. The details of pictures appear much more clearly in the original negative than when they are enlarged upon a screen of course, and for personal study or for the entertainment of a small audience the device could hardly be improved on.

A WHEAT CLEANING WRINKLE.

All wheat cleaning machines with sieve attachments, have as a rule, a larger capacity than is required. Wheat, as it falls on the sieve, passes through before traveling half the length of the sieve, says a writer in the American Miller.

All foreign matter, such as oats and



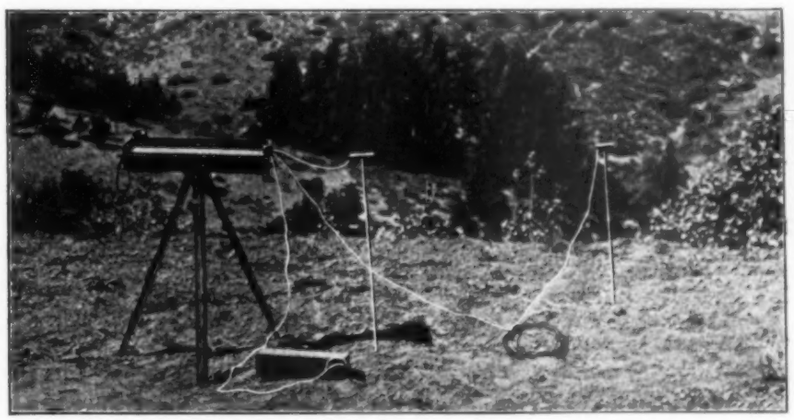
small sticks, must travel the remaining length of the sieve before dropping off. As this distance is generally a long one, a greater or less amount of oats and sticks will drop through the sieve and again become mixed with the wheat.

To overcome this, a piece of sheet iron is placed over the tail of the sieve, as shown in the sketch. The sheet iron should come up to within 2 inches of where the wheat ends in falling through. The necessary length of the sheet iron may be determined by measuring while the machine is in operation at the desired capacity.

By the insertion of wooden blocks at the junction point C. A. Moreno, chief engineer of the St. Louis Transit Co., has invented a device to abate noise at crossings.

ELECTRIC MACHINE THAT LOCATES ORES.

The up-to-date prospector for precious metals and valuable mining claims no longer relies entirely upon his ability to guess correctly, but prosecutes his search with the aid of carefully made scientific instruments. One of the most recent of these ore finders is the work of Fred H. Brown. Enterprise says: The appliance is a simple one and operates by measuring the earth's electrical resistance at the spot tested. As is well known, the earth, under ordinary conditions, is a poor conductor, while metals, particularly gold, silver and copper, are among the best known. The presence of these metals, therefore, increases the earth's conductive efficiency. By inserting rods in the ground at a definite distance apart and passing an electric current from one to the other, then measuring the ohms or units of resistance, an almost positive determination may be made.



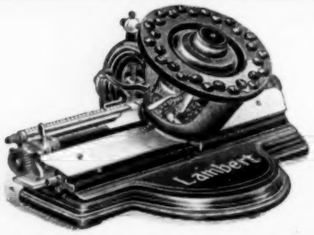
Electric Ore Finder

By repeating this operation in various directions over a claim the direction of ledges may be very accurately determined. The apparatus consists of the Ferreshunter, or resistance box, which rests on a tripod, a battery, some brass rods, and some insulated copper wire.

WHITE "INKS" ARE ONLY PAINTS.

The fluids appearing on the market as white inks, are only white paints, as a white solution cannot be made. A paint suitable for use as an ink may be made by grinding zinc oxide very fine on a slab, with a little tragacanth mucilage and then thinning to the required consistency to flow from the pen. The mixture requires shaking or stirring from time to time to keep the pigment from separating. The "ink" may be preserved by adding a little oil of cloves or other antiseptic. White marks may sometimes be made on colored paper by the application of acids or alkalis. The result, of course, depends on the nature of the coloring matter in each instance and the effect of any ink of this kind would depend on the nature of the coloring in the paper.

A fire engine at Manchester, N. H., has been in service 27 years and has never had any repairs to the boiler.



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A piece of black velveteen, perhaps a quarter of a yard, makes the most satisfactory brush for silk that can be obtained. It removes the dust perfectly without injuring the fabric.

M. F. Reese, 124 Brook avenue, New York, wants information about localities on the James river, in Virginia, suitable for the establishment of a kindling wood factory.

The steamship Maine, built by the Martland Steel Co., and recently launched, has a capacity of 11,000 tons of cargo and 750 head of cattle.

One of the best methods of transmitting power in shops is in the employment of compressed air as the medium of transmission.

Rawhide rope is handsome and astonishingly strong. At a little distance it looks like very white and clean new hempen rope.

The Illinois Central Railroad has just placed an order for 50 new locomotives to be used on its Southern lines.

TELEPHONES THAT GIVE FIRE ALARMS.

Every home, store or office which has a telephone can have an automatic fire alarm. An electrical device which is not expensive and which is easily attached to the telephone does the work, and does it automatically. A small thermostat about the size of a watch is employed. This is very sensitive to a rise in temperature and the instant the room becomes heated to the danger point the connection is made and the alarm sent in over the telephone wires to the telephone exchange. No changes are required in either the telephone itself or at the telephone switchboard.

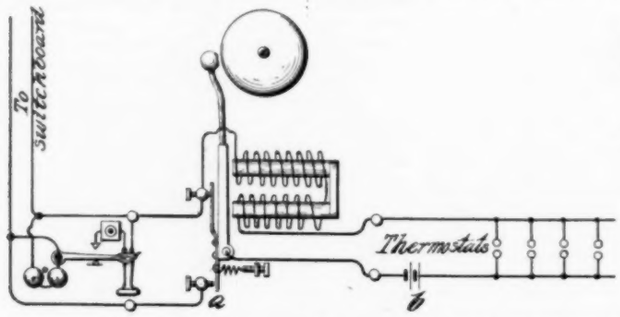
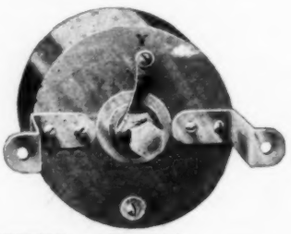
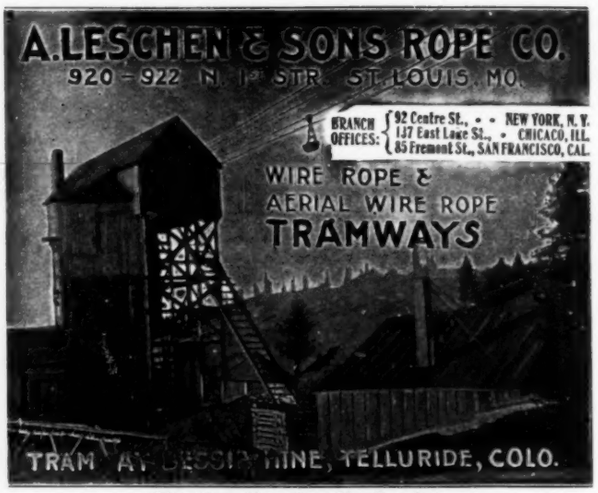


Diagram of Connections.



FIRE-ALARM APPARATUS FOR TELEPHONE SYSTEMS. Thermostat.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STOLE A STREET CAR.

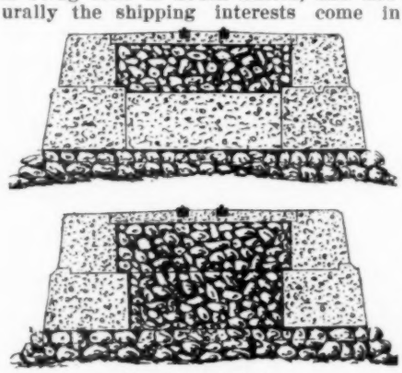
Two Lowell, Mass., boys were arrested recently on the charge of stealing an electric car from a local railway. A companion of the young men who lived in Tyngsboro was complaining in the middle of the night of the long walk he was going to have to reach his home. The accused volunteered to get an electric car from the shed and take him home. The outward trip was made safely in good time, but on the return the car left the rails at a corner and was found overturned in the roadway.

DEVICE TO DESTROY SUBMARINES.

No sooner does some one devise an armour which cannot be pierced than some other person invents a new shot that will do that very thing. And now a Pittsburg man has invented a minute chaser which can be operated and controlled by means of wires from a warship which will follow in the wake of a submarine vessel and blow it to atoms before it has a chance to perform its mission. The submarine is located by the bubbles which come to the surface whenever it is in motion under water.

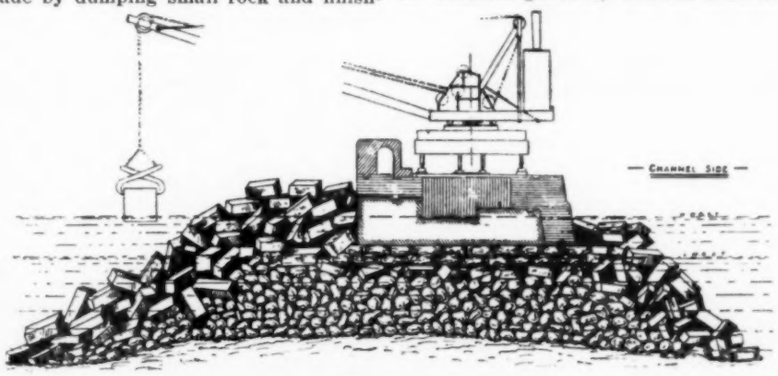
BUILDING BREAKWATERS IN SOUTH AFRICA.

A large amount of government work is being done in South Africa, and naturally the shipping interests come in



Concrete and Stone

for a large share. Great breakwaters and piers are being constructed by the English engineers. At Durban harbor, where over $10,000,000 are being spent, two methods are employed: the all rock, and rock and concrete. The all rock is made by dumping small rock and finishing with large blocks. In the cement work small rock is used for foundations and filling, as shown in the illustrations.



Stone Breakwater

PICRIC ACID IN GASOLINE.

Putting picric acid in gasoline for motor bicycles improves the action of the engine says a writer in the Motor Age, who says: "After straining the gasoline I put it in the tank of my motor-bicycle. The motor fired on the first turn of the pedals, and I was at once convinced that the power of the motor was increased, as the noise from the exhaust, due to the explosions, was nearly twice as loud as before. I immediately started out to try the stiff hill which I never climbed before without pedaling. The machine took me up the hill in great style with my feet off the pedals all the way up. I was so pleased with the results that I ran until my gasoline tank was almost empty, and then had to get back home on 'common gasoline,' and the difference was surprising. I used up all the 'picric-gasoline' without a single misfire or any signs of the spark-plug sooting."

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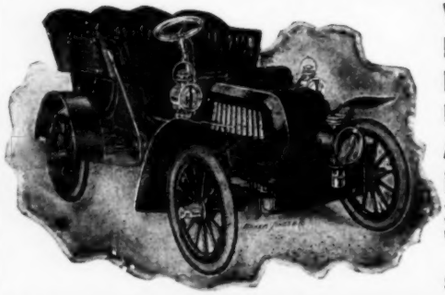

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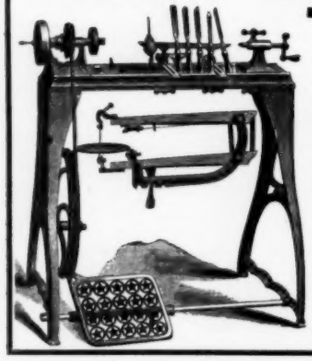

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SIGNAL COVERS ON HEADLIGHTS.

A Toledo, Ohio, man has patented an arrangement whereby in simply pulling a lever, conveniently located in his cab, an engineer may throw a red or green screen over his bright headlight, says the Railway Review. The red screen will indicate to the engineer of a locomotive approaching from the opposite direction, that the train is on the main track. It operates as a danger signal. The green screen indicates that the engine upon which it is displayed, is upon a siding, and trains may safely pass on the main track.

DARING NAVAL EXPERIMENT.

Within the next few months at Brest, France will attempt one of the most daring experiments in naval annals, which will consist of firing a shell against the turrets of the new warship Suffern.

The shell will be fired from the twelve-inch gun of the cruiser Massena at a distance of 1,312 feet. The shell being non-explosive, the result of such an impact will make an interesting study.

Where is the St. Louis balloon?

ELECTRIC AUTOCAR IN BELGIUM.

Orders have been given by the International Sleeping Car Company for building an electric autocar, says the Journal de Bruxelles, which by next August will be in service upon the Belgium State railroad to run between Brussels and Ostend. The distance is 78 miles and it is expected will be covered in about an hour. The carrying capacity will be 40 passengers.

UMBRELLA AS A LIFE BUOY.

The steamer Ville d'Oran had just arrived from Algiers, says the Coast Seamen's Journal, and a boat had been sent for the doctor of the ship as she was on the point of sailing. Hardly had it started on the return journey to the vessel with the doctor on board when a tremendous thunder storm burst, the rain falling in a perfect deluge. The physician is a careful man, having prudently brought an umbrella with him and was making the best of a bad joke when a sudden lurch of the boat tumbled him into the sea. The sailors were busily engaged in pulling for all they were worth and did not notice the disappearance of the doctor who did not know how to swim and with whom it would have fared ill had he not retained his hold on the precious "gingham." The open umbrella acted as a life buoy and he drifted safely along for nearly half an hour, until his friends on board the Ville d'Oran, attracted by his shouts, put off to his rescue. The little doctor owes his marvelous escape to the queerest of life buoys.

THE STEAMSHIP KAISER WILHELM II.

Six hundred men are required to sail the great steamer Kaiser Wilhelm II which has recently gone into service. Of this number 277 are in the engineer's department, 231 on the cook's and steward's, and only 45 are genuine "sailors." The Shipping World, London, says the ship was sixteen months in construction, during which time material was built into her at the rate of 513 tons a day, reckoning twenty-six working days to the month. Her principal dimensions are: Length, 706 ft. 6 ins.; breadth, 72 ft.; depth, 52 ft. 6 ins. Her registered tonnage is 20,000 tons, and her displacement, in salt water, at 29 ft. 6 in. draught is 26,500 tons. Her bunker capacity is 5,700 tons, and her double bottom will carry in all 3,165 tons of water. The hull itself is divided into nineteen water-tight compartments, the engines being further protected by a longitudinal bulkhead. There are in all seven decks, the orlop, lower, main, upper, lower and upper promenade decks, and awning deck. She is driven by two bronze propellers, each having a diameter of 22 ft. 10 ins. Each propeller weighs 70,400 lbs. These propellers are driven by four sets of quadruple expansion engines, two sets to each shaft. The high pressure cylinder of each engine is 37½ inches diameter, the first intermediate 49¼ inches, the second intermediate 74¼ inches, and the low pressure cylinder 112¼ inches in diameter. The stroke in each case is 70¾ inches. By thus dividing the engines into four units, the power to be developed by each is only 10,000 i.h.p., but the use of only two shafts and two screw propellers involves the transmission of a larger power

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through shafting than has ever before been attempted. Each shaft carries practically 20,000 i. h. p. They are of nickel steel, and one of them formed a most interesting part of Krupp's display at the Dusseldorf exhibition. The thrust shaft is 25 inches in diameter, and the propeller shaft is 25½ inches, both of them hollow. Each line of driving shaft is 230 feet long and weighs 253 tons, of which the crank shaft weighs 108¾ tons. There are nineteen boilers in the ship, each weighing 114 tons, and discharging their smoke into four funnels. These funnels rise to a height of over 130 feet above the keel plate. Twelve of the boilers are double ended, and seven of them are single, there are in all 124 furnaces. The total heating surface is 107,639 square feet, in other words, just about 2½ acres. The tubes in the condensers unitedly represent a total of 46½ miles in length. The boilers will give sufficient steam for the 40,000 i.h.p. without resorting to forced draught, an open stokehold, with large cowls, being provided. In addition to the main engines with their 16 cylinders, are throughout the ship 79 engines for various duties. These include 17 pumps for bilge, fire, and other similar work, the capacity of these being nearly 10,000 tons of water per hour.

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A STRIKE BULLETIN.

Me ole man struck, away las' June, an' hasn't turned a lick—
He hasn't even cleaned de clay dat wuz stuck ter his pick.
He didn't like de wages dat dey chucked inter his mitt—
I guess dat's what de trouble wuz, but anyhow, he quit.
But, say, I guess de fambly's in de bigges' kind o' luck—
De ole man's in de walkout, but me mudder hasn't struck.

Me sister Liz wuz workin' in a place dat sells quick lunch.
De boss, he makes some kicks, an' dat starts trouble wit' de bunch.
Dey all goes out an' won't go back—you oughter talk ter Liz—
She's makin' speeches ever'wheres about de strikin' biz.
Dat's all she does—jest chews de rag about de moneyed duck.
But still we's eatin' reg'lar, 'cause me mudder hasn't struck.

Me brudder Bill—he's strikin', too—been out sence May de first.
He says de slob dat takes his job is lookin' fer de worst.
Dey wants him back, but no, b'gee! He says dat he won't stan'
Fer wolkin' dere, unless de boss will fire some udder man.
I'm strikin', too. I hops de bells, an' wants anudder buck.
But here at home we's eatin', 'cause me mudder hasn't struck.

Well, say! Now, on de square, it's fun ter hear me brudder Bill
An' sister Liz an' de ole man start up a-talkin' mill
About how dey've stopped wolkin' jest ter teach de udder dubs.
An' all de time me mudder keeps a hustlin' at de tubs.
I likes de ole man's backbone, but I likes me mudder's pluck—
I guess we'd all be hungry if me mudder'd gone an' struck.

—Chicago Tribune.

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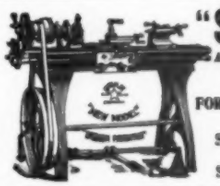

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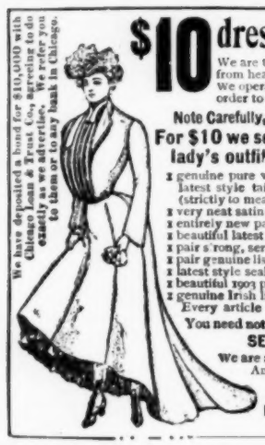

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